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Amperometric enzyme immunosensor for determination of Klebsiella pneumoniae antigen

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Abstract

An amperometric enzyme immunosensor for detecting the bacterial antigen Klebsiella pneumoniae has been developed. The biosensing part of this analytical device consists of cholinesterase and antibodies to Klebsiella pneumoniae, co-immobilized into the cellulose nitrate membrane. The conditions of immunosensor functioning (ratio of enzyme and antibodies, substrate concentration, pH of working buffer solution) were chosen. The sensor with antibodies in dilution 1:20 demonstrated the best analytical characteristics. Working concentrations were ranged from 1x10-9 to 1x10-3 mg/ml, the detection limit was 5x10-10 mg/ml. The cross-reactivity of used antibodies to antigens of bacteria, causing similar diseases was evaluated. The conditions of immunosensor reuse by regeneration of its biosensing part were chosen. The developed immunosensor was probed on blood sera of patients suffering from urea tract diseases.

Keywords

Amperometric, Antibodies, Antigen, Enzyme immunosensor, Klebsiella pneumoniae